

I Claim

Sub 1  
1. ~~A data processor for connection to a linear towed sonar array [of the type]~~ comprising a plurality of modules joined end to end and each module comprising a flexible fluid-filled hose housing a plurality of linearly spaced hydrophones, the processor comprising means to receive signals from each sensor in the array and wherein:

at low frequencies the outputs from all the hydrophones in each respective module of the towed array are added together with uniform weighting and without relative phase delays so as to form respective single channel outputs.

2. A data processor as claimed in claim 1 wherein beamforming is done by providing phase delays in the processor such that the weighted sum of a number of module outputs can be formed by means of phase delays appropriate to a selected beam direction.

Sub 2  
3. A <sup>sonar detection system</sup> ~~data processor~~ as claimed in claim 2 wherein a set of frequency dependent weights is selected for beamforming on connection to the module outputs such that the sum of the weighted hydrophone outputs has zero response to low frequency vibration.

4. ~~A sonar detection system comprising a linear towed sonar array [of the type]~~ comprising a plurality of modules joined end to end and each module comprising a flexible fluid-filled hose housing a plurality of linearly spaced hydrophones, and a data processor comprising means to receive signals from each sensor in the array and wherein at low frequencies the outputs from all the hydrophones in each respective module of the towed array are added together with uniform weighting and without relative phase delays so as to form respective single channel outputs and wherein the hose material is selected such that the Poisson ratio is substantially equal to 0.5.

5. A sonar detection system as claimed in claim 4 wherein an end coupling is provided at the end of each module and high modulus internal strength members are included in each array module to resist anti-phase vibration of the module end-couplings.

6. A sonar detection system as claimed in claim 5 wherein the separation of the hydrophones in the array is small compared to the length of the array

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module so that the summed outputs of the discrete hydrophones closely approximate a continuous integral.

7. A sonar detection system as claimed in claim 6 wherein the module coupling length is short compared to the module length.

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